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2012-13 Planning Grant Project Activities

This document is the final report for the NEH Sustaining Cultural Heritage Collections grant entitled: Anthropology Collection Storage Improvement and Sustainability Planning for the Carnegie Museum of Natural History, grant number PF5026012. The principle investigator was Dr. Sandra Olsen, Head of Anthropology at the Carnegie Museum of Natural History (CMNH). The following describes the work that was accomplished during the year's duration of the grant. The chief goal of this project was the planning, writing and submission of an implementation grant to upgrade the Anthropology collection storage facility at the Edward O'Neil Research Center (EORC) of CMNH. In the process of conducting the facility's needs assessment, great strides were made in centralizing archives, photo archives, storage, supplies, and collections by subject and function. In addition, large volumes of old computer equipment, furniture, and books were responsibly recycled. New and enhanced sustainability practices were put in place and have already manifested significant energy savings.

During the course of the year, all of the goals set forth in the original proposal were either completed or a regular, ongoing process was initiated to ensure they are met in a timely fashion. No significant changes were made to the project personnel except for the external architectural firm. Elagin Architecture was substituted because of their ongoing collaboration with the Carnegie Museums of Pittsburgh and familiarity with regional building regulations. No federal matching funds were employed. This project did not involve the use of computer applications beyond occasional checks of the Anthropology database when objects were moved. However, as of January 2014, the outdated Paradox database is in the process of being converted to KE EMU, a new and very successful program. This will take approximately four months to completely convert the 250,000 ethnological and historical records. This computer software transfer is not part of this grant, but will greatly facilitate record keeping when the archaeological collections are moved into new storage and their database is finally digitized.

Accomplishments

During the past year Carnegie Museums of Pittsburgh Facilities, Planning and Operations (FPO) has made significant improvements in the operation and control of the HVAC system at the Edward O'Neil Research Center (EORC), where the Anthropology collections are housed. Three recommended short-term procedures are now incorporated into regular scheduled maintenance: checking the humidifier and steam boiler sizing to ensure they are capable of maintaining the minimum set points, initiating biannual inspections of the rooftop equipment to catch leaks before they occur, and initiating an annual replacement of the humidifier O-rings.

In its ongoing efforts to establish more sustainable practices and lower energy consumption, FPO has implemented the concept of seasonal "free cooling." Free cooling is an energy-efficient way to operate climate control systems by relying on low external air temperatures to assist in reducing the temperature of water in the cooling tower on the

roof. This strategy is done on days when the outside air temperature is below 45°. This is achieved by closely monitoring the two chillers and making control modifications. In the past, the unit was operating on a minimum of one chiller year-round. By greatly reducing the use of the chiller compressors in the late autumn through early spring, the HVAC is much more energy-efficient. This should also significantly extend the life expectancy of the equipment. Along with the free cooling, FPO added controls to shut off the fans on the cooling tower based on the temperature of the water in the tower. These two modifications to the controls have had a significant impact on the EORC utility bill over the course of the last year and resulted in a more sustainable facility. During this year, it was discovered that one of the fans has been operating sub-par, causing the back-up fan to run at the same time. By replacing the primary fan so that the back-up fan is not triggered to run all the time, the utility bill has been reduced a further $400 monthly and consumption is lower.

This year FPO also removed an old chimney that had been used for a vent stack for one of the boilers. The chimney was a source for air infiltration as well as a constant source of water seepage in the EORC basement. This project solved the water seepage issue and helped to achieve our goal of a tighter building envelope. In order to assess the EORC envelope, in 2013, FPO surveyed the entire exterior, including the roof, with an infrared camera to record areas of excessive heat loss. This study did not reveal any serious problems, however, new weather stripping will be installed around the external doors to reduce airflow around them and prevent pests from entering the building.

FPO also conducted airflow tests on the fume hoods in Conservation (EORC First Floor) and Mammals (EORC Second and Third Floor) to determine if there was unnecessary heat or cooling loss by the hoods. All of the hoods passed inspection. The hood in the former Anthropology darkroom was closed since the newly renovated room is now an archaeology laboratory without need of such ventilation.

Venture Engineering conducted a thorough assessment of the HVAC system and has furnished a report of the repairs that are recommended to make the system more sustainable and efficient. FPO will conduct this work in upcoming years as matching for the NEH implementation grant and as a continuation of their improvement of the EORC climate control.

To develop a plan for installing a high-density movable storage system for archaeological collections in the First Floor front area, external contractors worked closely with our team. First, Venture Engineering conducted a floor loading study of this area that included visual inspection, ground-penetrating radar and an investigation of the history of the building. Based on their expertise and informed estimates for the weights of the packed storage system, they determined that floor boring was not required. The GPR study revealed that the concrete flooring in the front sits directly on the ground, does not contain rebars, and is 6” to 6.5” thick. Prior to conversion of the building to museum storage, it served as an automotive dealership for many years, and cars were parked on the concrete floor in the front area. The lack of damage from years of such extreme weight bearing was part of the evidence leading to their determination that installing a compactor storage system was feasible.

The museum enlisted Penn Record Systems, a dealer of Borroughs high-density movable storage systems, to work with us during the planning phase. Borroughs storage systems were chosen because they are sustainable in many ways, including the fact the

company is located close enough to Pittsburgh to meet LEED requirements. Their local representative, Len Zalno, provided a floor plan, weight estimate, detailed description of the materials and equipment that would be used in the compactor storage system, and cost estimate.

Delta Design was selected as the provider of museum-grade cabinets to accompany the movable storage system because the CMNH ethnological collections have been successfully stored in Delta cabinets through the years, the company has an exalted reputation in the museum field due to their precision and high standards, and the company has very sustainable methods of manufacture. Delta Design provided detailed drawings and specifications for their cabinets and assisted in determining the best configuration for the archaeological materials to be housed in them. They also provided the engineers and Penn Records Systems with weight estimates of the loaded cabinets. It is estimated that the combination of high-density movable storage, with its reduced number of aisles, increased height, and efficiently designed cabinetry, will nearly double the storage volume in the First Floor front area.

Although the focus is on providing improved housing for the archaeological collections, this impacts the whole of Anthropology. In order to ensure that all the goals were met in the most efficient and effective manner, the design firm Elagin Architecture was engaged. Their designer, Sergei Matveiev, thoroughly recorded all the furnishings on the First and Second Floors and developed a plan that minimized the amount of collections to be moved while improving their organization and gaining significant space in the process.

Over the course of this year, three laboratories and two offices have been vacated, creating significant new space for storage and research. This new space has already been utilized on a temporary basis for the storage of exhibition crates from *Roads of Arabia*, as well as our own traveling crates and boxes of newly published books by the PI. Having an open, dynamic area for temporary storage is vital to the yearly fluctuations of needs. The two new office spaces will be retained for visiting scholars and graduate students. The total area vacated amounts to: 1800 sq. ft. for storage and 600 sq. ft. for office space.

During the planning year, Amy Covell, Anthropology's Curatorial Assistant, played a vital role in establishing a volumetric database for the collections, shelving units, and archival cabinetry in different areas of Anthropology, which greatly facilitated the assessment of current space utilization. These data also assisted the architectural designer's implementation plans for more efficient arrangements of cabinetry and other furniture. Covell's data were useful for the engineer's and storage companies' assessment of floor loading, and feasible layouts, as well.

Anderson, Harding and Covell have spent considerable time this year developing prototypes for conservation-quality supports, storage mounts and packaging. Anderson has trained Harding and Covell in making cavity mounts, ring mounts, and stackable tray mounts. These methods create an acid-free contact surface for the supports, provide barriers against friction, and make it possible to move the objects without actually touching them. This year, over 200 mounts of Ethafoam™, polybatting, backer rod/trirod, and Tyvek™ were created for Roman glass vessels. With this new proficiency, Harding and Covell can train interns to make supports for the archaeological objects going into the new Delta cabinets.

Another very important process that Anderson helped to establish is the way in which large textiles are stored, using Marvelseal™ and stockinet. The Marvelseal™ must first be ironed onto cardboard tubes, then covered with stockinet. The textile is then rolled onto the tube with a layer of protective muslin so that it does not rest against itself or become exposed to high light levels. The roll is then stabilized at both ends and suspended from a wall mount, so it does not become damaged from pressure by the bottom of the roll resting on a surface. There are over 80 oversized textiles in the ethnological collection that will need to be prepared in this manner. They will be suspended on a wall on the Second Floor that will be cleared by the removal of two safes.

Covell has been diligently testing new prototypes of stackable tray mounts and individually designed boxes and supports on a large collection of archaeological material from Utah. The collection represents the diversity of materials that will be encountered when decompressing artifact storage after the compactor units are installed on the First Floor. The objects range from small ceramic sherds to a wide variety of perishables and human remains. All human remains must be in closed boxes, but stone and ceramic material can be in open stackable tray mounts that are made specifically for each accession number. In preparation for rehousing human remains, several different types of boxes, trays, and materials were purchased that would maximize efficiency. Based on a commercial osteology box purchased as a prototype, Covell has developed a respectful and archival-quality resting place for the individuals in the collection. To aid in the proper care of human remains, Covell attends National Native American Grave Protection and Repatriation Act (NAGPRA) webinars. Currently there are approximately 105 non-archival cardboard boxes in the archaeological collections that need to be replaced with these new boxes. For further prototype experiments, Coroplast™ and Melinex™, and Relic Cloth™ were purchased to preserve the collections more efficiently and reduce the necessity for adhesives.

Anderson and Covell performed a test on different materials to see if they were safe to use in close proximity to artifacts. Hoping that Memory Foam would be a new contender for stabilizing artifacts, they purchased a pillow and cut some foam for this procedure. It proved to be risky for long-term storage, but may be effective in transporting objects short distances. They are currently testing Senflex™ polyethylene laminated foam, a soft, versatile planking used for packing and shipping very delicate materials.

Anderson has provided designs for a vertical spear storage system, wall-mounts for saddles, and wall mounts for over-sized textiles that will make it possible to store many of our accessions safely against one wall on the Second Floor.

Audiences

The audiences in this planning grant may be seen as those who will be utilizing the Anthropology collections in the future. These include the museum staff, established academic professionals in Anthropology and related fields, undergraduate and graduate students, as well as lay public with specific interests. For the professionals and students, these consist of individuals from around the world and a wide variety of institutions including, but not exclusively museums and universities. In 2012-13, due to the small

staff size and our focus on facility improvement, the numbers of individuals accessing the collections has been somewhat reduced in the course of this year. Numbers also tend to fluctuate considerably from year to year. Those using the collections during this year include US and foreign citizens, both male and female adults. CMNH Anthropology considers the training of undergraduate and graduate students to be a high priority in order to keep the field of career museum staff in this country vibrant and qualified. In 2013, Anthropology trained nine interns from the University of Pittsburgh, Duquesne University, and Bradford University, UK (eight females and one male). There were three visiting graduate students working on projects in the archaeological collections (two female, one male) and ten academic professionals using the collections. Children in various programs, as well as board members, donors, foreign visitors, and other adults occasionally take Behind the Scenes tours of the Anthropology collections. This year there were 12 STEM female children ages 8-11 who took a Behind the Scenes Tour. Another 35 visitors came through on tours or as special visitors, including three gentlemen from the National Museum of Saudi Arabia, Riyadh, one male from Costa Rica, two Peruvian women and four Chinese scholars (three men and one woman).

This planning grant period did not witness an increase in public visitations of the EORC, which is strictly a research and collections facility, because our work primarily focused on space reorganization and movement of equipment, collections and furniture. This made it difficult at times, but every effort was made to keep access to the collections open to scholars and to continue to conduct several Behind the Scenes tours. However, the work that was accomplished and the goals for future improvements to storage will greatly facilitate access for visiting scholars going forward. Improved collection storage and centralization of functions within EORC will also make it more attractive, spacious, and convenient for Behind the Scenes tours and help to serve a much wider audience. No other institutions were involved in this planning grant.

Evaluation

The nature of this planning grant to improve storage did not lend itself to the type of visitor survey used in public programs, so the evaluation was performed by our own staff and by our superiors in the museum's leadership. In this regard, we evaluated the extent to which we met the goals described in the grant proposal. The goals to be achieved fall into two categories: a. removing and responsibly discarding old equipment, furniture and books, as well as reorganizing of materials by category (photo and paper archives, collections, research, and library), and b. planning for the implementation of a major new collection storage system. The plans that were put forth were developed with the assistance of the Carnegie FPO and external contractors, including an architect, engineers, cabinet company, and space planner. The result of this planning included the submission of a comprehensive NEH Sustaining Cultural Heritage Collections implementation proposal. That proposal will serve as a guideline and strategic plan for the next few years in terms of improving the Anthropology collections facility.

During the one-year period, the staff eliminated all the old furniture and equipment no longer needed, with the exception of a few cameras and lenses that we still hope to be able to sell in the future. All of the books culled from the Anthropology library as inappropriate or out of date were removed, totaling 10 five-shelf bookshelves of

unwanted books. Nearly all were sold to a local bookstore to establish a fund for maintaining our professional journal subscriptions. This resulted in relieving stress on the extremely overcrowded library, freeing up space for future acquisitions of journals, primarily. The ethnological collections area has been cleaned up, supplies are better organized now, and a detailed study of space utilization has been drafted.

All of the photographic archives were moved to the room designated for that purpose. There are still eight filing cabinets of paper archival material remaining in the collections area that are scheduled to be moved into the Paper Archives Room, and substantial reorganization of that area still has to be done. The museum hired a part-time archivist who has been training the Anthropology staff to ensure that the proper procedures for eliminating, saving and filing archives are set in motion going forward. Detailed culling and reorganization of individual archives was beyond the scope of this project, but is planned in the near future, once the archaeological compactor storage units have created more space for archival storage.

The amount of unwanted material that has been removed in a responsible, sustainable way is impressive, particularly for a 12-month period. However, there is still work that remains to be done in the future. Because a plan was put in place, it is clear which actions need to be taken and the goals to follow through with improvements have been delineated in the proposal submitted to NEH for implementing the new storage system.

Continuation of the Project

The submitted NEH implementation proposal outlines in detail what needs to be done to achieve success and the parties (internally and externally) who will fulfill all of the necessary tasks. Anthropology and Conservation are committed to following through with the strategic plan as set forth in the new NEH proposal. A team has been established consisting of Anthropology, Conservation, Carnegie FPO, Venture Engineering, Elagin Architects, Space-Savers, and Delta Cabinets. This partnership will put CMNH Anthropology in a strong position to fulfill all the goals identified in this planning stage. Anthropology curator, Dr. Sandra Olsen, who is the PI on this grant is leaving the Carnegie Museum of Natural History so Gretchen Anderson, Conservator, will take over the direction of the project.

Long Term Impact

The long term impact of this year's planning will be significant in terms of the already completed space reorganization and the increase in open areas through removal of enormous quantities of books, furniture and equipment. As a result, two offices and three lab spaces have been cleared out, providing new areas for temporary or permanent storage and visiting researchers. This helps in no minor way toward relieving the overcrowded conditions of collections. Most importantly these areas will ease the temporary move of the archaeological collections during the installation of the compactor system.

Even more important are the sustainability improvements that have been adopted and the plans for even greater conservation going forward. These steps will greatly reduce energy costs and consumption through the years, as well as being a socially and

environmentally responsible plan of action. In addition, this year of work has laid out a detailed, step-by-step plan for the next three years that, if completed, would significantly reduce overcrowding and improve Anthropology collection storage at CMNH. The archives, office space, and research areas have been and will continue to be greatly improved and organized. Although this stage of space planning has not expanded our public visibility at the moment, one aim is to increase the number of Behind the Scenes tours for a wider audience and to facilitate use of the collections by a much larger number of scholars. The ability to increase visitor numbers and to better store invaluable collections is dependent on the institution's commitment to staffing research and collections. The recent decline in staff numbers could have a deleterious impact on CMNH collections care if the trend continues, but an improving economy and strong leadership could reverse this trend in a very short time.

Grant Products

The main grant product achieved during this period is the NEH Sustaining Cultural Heritage Collections grant proposal for implementation of the plans for improving storage of the Anthropology collections at CMNH. In addition, a white paper has been prepared outlining the achievements and the remaining tasks to be completed. The team plans to present the results of this grant at the next Society for the Preservation of Natural History Collections (SPNHC) meeting in Cardiff, Wales, in June 2014.